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ABSTRACT

Following an analysis of Vermont's present system of allocating state and federal vocational education funds, alternative formulas and methods for allocation are presented. The first chapter focuses on concerns raised with the present system, particularly the data used to allocate money and the focus on concern for distribution across institutions as opposed to specific programs and populations. Implications of changes in federal law (Title II of the Education Amendments of 1976--P.L. 94-482), which required Vermont to modify its formula for dispensing federal monies are examined in the second chapter. Focus in the third chapter is on data quality. Current allocation formulas and possible alternatives are examined in light of clerical accuracy, data definition, data measurement, and data timing. After analyzing a variety of formula alternatives, the fourth chapter recommends a new formula consistent with new federal regulations. The final chapter covers additional revenue and expenditure issues, e.g., methods of counting district or institutional expenditures and the effect on allocation. Recommendations made include change to a variable matching grant-type formula. It is concluded that the use of expenditures (as opposed to pupils) as a base for a variable matching grant would generate a distribution more closely approximating the current one. Factors recommended for inclusion in the new formula include unemployment, number of low-income families relative to the total population of the area, and number of disadvantaged students in relationship to the total enrollment. (JT)

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FINANCING VOCATIONAL EDUCATION IN VERMONT

Final Report

Submitted to the Director
of Vocational-Technical Education
State of Vermont
Department of Education

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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September, 1977

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I

OVERVIEW

Vocational Education as a distinct program of study in Vermont is now thirteen years old; the first State Plan was developed in 1964. During that period, the goal of this program has remained unchanged:

> to assist in the development of local programs that will enable each Vermonter to have, at the end of his/her formal education, a knowledge of the 'world of work' and acquisition of a salable skill.

The basic philosophy, established through policy guidelines by the State Board of Education, has also remained constant. Of primary importance is that programs be designed to serve "all youths and adults who can benefit from (these) programs." Because of the higher costs associated with this type of education relative to more traditional secondary study, and because of the likelihood that benefits will accrue more to the State as a whole than to a given individual district, the State has accepted the responsibility for providing additional monies for support.

Initially, those funds were of two types: (i) the State provided about 85% of the initial capital costs for building area vocational centers--the original policy guidelines of the State Board called for building a system of area centers, each of which was to be attached a comprehensive high school but was to serve an entire area; and (ii) general aid to help defray the higher costs of this type of education--these additional costs have been estimated to average about 25 percent of total operating costs. The system of general aid was modified subsequently to reflect 1968 changes in the federal law for financing vocational education and to be, in part, consistent with

the State's new system for providing general elementary and secondary education aid--the so-called "Miller Formula." Basically, these modifications introduced the principle of "targeting" non-local revenues toward the attainment of specific objectives.

Recently, concerns have been raised with the present system of providing aid for vocational education. In particular, the data used to allocate "formula" monies has been questioned. These concerns were reinforced by new changes in the federal law ("The Education Amendments of 1976"), which required Vermont to modify its formula for dispensing federal monies as a condition of receiving those monies. This study is intended to be responsive to those concerns. It reports on research and analysis done under contract with the Department of Education subsequent to the recommendation and approval of the State Board of Education at its meeting in February, 1977.

The report contains five chapters (exclusive of this initial summary chapter). The first of these (i.e., Chapter II) presents the framework for the analysis. The remaining four chapters each cover a specific topic of concern to the State Department (and the State Board). Chapter III discusses data quality and data alternatives. Chapter IV analyzes the impact of P. L. 94-482 ("The Education Amendments of 1976") on the present system of financing vocational education in Vermont. Chapter V analyzes a variety of formula alternatives and recommends a new formula which is consistent with the new federal regulations. Finally, Chapter VI discusses alternative methods of counting expenditures and of allocating state monies for vocational education. In addition there are three appendices dealing with, respectively: (i) relevant laws and regulations; (ii) the budget for vocational education; and (iii) the data sources and methods used for doing simulations of aid alternatives.

The balance of this chapter highlights each of those chapters and reports the findings and recommendations in each. The basic document for identifying current objectives, procedures and programs of vocational education is "The Vermont Plan for Vocational Education: 1978-1982," prepared by the Vermont State Department of Education's Division of Vocational-Technical Education and submitted to the U. S. Commissioner of Education (hereafter this document will be referred to as the State's "5-Year Plan").

I. Framework

As noted earlier, Vermont's program in vocational education was established by the Legislature in 1964. To accomplish the ends of that legislation, the State has established fifteen "area vocational centers" (a sixteenth is currently in the planning stages); about 80 percent of all funds spent directly on vocational education in Vermont are expended through these centers. Most of the remainder is used to fund smaller programs at other secondary schools and for programs (including teacher training) at postsecondary institutions. 3-4 percent of the total is used directly by the State Department of Education to operate its Division of Vocational-Technical Education. (More detailed budget information is provided in Appendix B of this report.)

The State Department relates to local agencies in a two-fold way: first, by reviewing and approving annual program plans submitted to the Department by each of the local agencies seeking assistance; and second, the various means of providing financial assistance to these agencies. Currently monies are allotted to local agencies through four channels: (i) basic support determined through a formula; (ii) direct payments for particular staff; (iii)

categorical grants for specific programs; and (iv) tuition for certain students. Overall, it continues to be the policy of the Vermont legislature that the non-local share of funds for vocational education should be about 25 percent of the total. Since tuition payments are actually made to sending districts, the actual non-local share is closer to 30 percent. These funds may be characterized as being distributed in any of four ways: (i) to various institutions; (ii) to specific vocational programs; (iii) to certain subsets of the population; and (iv) to particular areas of the State. Finally, there are essentially three types of decisions the Department may make with regard to allocating monies: (1) to what extent will allocations be pre-determined through the "plan-approval" process; (2) what mechanisms are most appropriate for distributing aid; and (3) what weights should be assigned to the various possible elements of a given mechanism.

Findings:

1. Because of the few number of institutions and the uniqueness of many programs, the State has made little use of its powers under the plan approval process.
2. While the State 5-Year Plan and the federal law both focus on specific programs and populations to be aided, the principle concern with the implementation of the formula has been the distribution across institutions.

II. Impact of P. L. 94-482

Title II of the "Education Amendments of 1976" (commonly referred to as P. L. 94-482) impacts upon all aspects of vocational education in Vermont.

The precise effects of this impact, however, are difficult to assess because the regulations implementing and interpreting this act have yet to be finalized. The following are based upon interpretations of August, 1977.

Findings:

1. The law clearly recognizes two distinct processes involved in determining the distribution of non-local funds: (i) program approval; and (ii) aid allocation mechanism. The intent of the law appears to be that the first of these be used in a much more active way than is the current practice in Vermont. In particular, approval of specific programs related to manpower needs should be part of this process.
2. The law requires that priority be given to economically depressed areas which propose new programs designed to meet new and emerging job opportunities. At present, the regulations require that this factor be included as part of the aid allocation mechanism rather than the program approval process.
3. Two sections of the act place very explicit constraints on the distribution of federal (and, to some extent, matching state) monies.

   (i) Subparagraph 106 (a)(5)(B) establishes the basic criteria; clause (i) of that subparagraph provides detail to these criteria with respect to distribution across areas:

   > "the State will use as the two most important factors in determining this distribution . . . relative financial ability of (local) agencies . . . and the relative number or concentration of low-income families or individuals within such agencies . . ." (Emphasis added; note that "most important" is currently interpreted to mean

"no other factor may have a weight equal to or greater than either of these two factors.")

(ii) Section 110 establishes specific constraints with respect to the distribution of monies across <u>populations</u> (i.e., those served under subparts 2 and 3):

"at least 10 per centum . . . for handicapped persons; . . . at least 20 per centum . . . for disadvantaged persons; . . . at least 15 per centum for [post secondary]." (At the present time there is some disagreement regarding whether the funds required to be set aside for handicapped and disabled students can only be applied to excess costs or whether they can be used to cover the ordinary costs of teaching these students as well.)

(iii) While these constraints are not inconsistent with the objectives of Vermont's current formula, they will cause the weights in that formula to be changed substantially; and this change may seriously affect the effectiveness of the formula.

(iv) If the funds set aside for handicapped and disadvantaged students can be used only to cover excess costs, this requirement would cause a serious disruption to current funding patterns.

4. None of those portions of the law dealing specifically with the development of criteria for plan approval or aid allocation relate such actions to concerns about costs--i.e., either to whether programs are efficient or are cost effective.

III. <u>Data Quality</u>

"Data quality" is a term used to cover a number of different issues. Generally, however, these issues might be grouped into four types of concerns:

(1) clerical accuracy; (2) data definition; (3) data measurement; and (4) data timing. The eight specific items used in the current formula and possible alternatives were examined in terms of each of these issues.

Findings:

1. All of the current elements seem to be well-recorded, with the exception of the manpower factor. Here, some double counting appeared. The impact of this error on the formula, however, was insignificant--for no area center did the error exceed 0.2% of its total formula aid.
2. A major drawback to the current formula is that factors are defined in such a way that elements are not comparable to one another. Some are related to the size of the program, some to the size of the student body, some to the size of the population, and some simply to the rate of occurrence of the particular factor. This lack of consistency leads to some distortions in the allocation process and causes some factors to offset the effect of others.
3. The unemployment factor is open to alternative measurements. At the present time, only the month of November is used (being the most current at the time of aid calculation). However, it is not always representative of the previous year; the whole year figure would seem to provide additional information.
4. For many of the current items, data timing is a serious concern. In particular three items are taken from the 1970 census; changes which have occurred since then make the value of these items questionable. On the other end, some items (such as unemployment) are so current that they could not be used in the area centers' planning and budgeting process.

IV. Formula Alternatives

The current formula for allocating aid is effectively six independent formulas; in turn, each of these may be characterized as a "flat grant"--i.e., the amount of funds received by an institution may not be directly related to the size of the institution's program. The principle alternatives to such a formula might all be characterized as "variable matching grants." The principle advantage of this alternative type of formula is that it alters the implicit "price" of vocational education, and so encourages districts to expand their efforts.

Findings:

1. The present formula has worked well, largely because it is dominated by the two factors related to program size. As such, it behaves in part like a variable matching grant.
2. Some elements of the current formula are very unrelated to program size. The unemployment factor is the poorest in this regard. By looking only at the rate, there is no comparability of scale across area centers. In general, there appears to be a need to make all of the elements more comparable to one another, such as through using a common base (or denominator) in each factor.
3. There is significant variability in the stability of the various elements over time. The unemployment rate, for example, can change significantly from month to month. Using data based upon longer time periods tends to alleviate this problem.
4. In general, current factors are related to equity rather than to efficiency. It is generally believed that the absence of a "price

effect" and the large local share of expenditures required reduce the need for the state to consciously encourage efficiency.

V. Additional Expenditure and Revenue Issues

At the present time, the Division of Vocational-Technical Education only collects data on part of the area centers' budgets. Plant Operation and Maintenance are omitted. The chapter analyzes the effect of including these expenditures in the allocation base. In addition, the chapter examines whether non-formula state revenues, such as tuition and staff salaries, should be left as separate assistance or should be included in the formula.

Findings:

1. At the present time requiring a total budget from the area centers would have little effect on the distribution of formula monies. However, it could affect some tuition payments. Moreover, in raising the total identified expenditures, it could serve as a catalyst for increasing state appropriations and/or for making it easier for some centers to meet federal matching requirements.
2. Including tuition in the formula is likely to benefit host districts, assuming no subsequent decline in enrollments. Including ancillary salaries would have little effect (but would simplify procedures) if expenditures are used as a base for formula aid.

VI. Recommendations

Among the recommendations made in the full Final Report, the following would seem to be the most significant:

1. With regard to data items used in the aid formula:
   a) The State should only use items which are collected on an annual basis; data from the decennial census is of very limited value.
   b) Data items should be measured in such a way as to establish comparability across factors.
   c) In addition to seeking current data, concern should be given to the planning period of the area centers (and the time needed to expand or develop new programs). If necessary, the State might consider using longer time periods (e.g., two years) in defining factors which tend to be highly variable.
2. With regard to a new formula:
   a) Given the relative weights required by P. L. 94-482, the State should consider changing to a variable matching grant-type formula. Such a formula would insure greater consistency across area centers.
   b) If it is desired to continue the current formula, all factors should be calculated on a per pupil basis.
   c) With regard to what base to use for a variable matching grant, expenditures (as opposed to pupils) would generate a distribution more closely approximating the current one.
   d) Factors which should be included in a new formula are unemployment, number of low-income families relative to the total population of the area and the equalized grand list per pupil of the host district. All of these items should be converted to index values.

e) With regard to the disadvantaged:

(i) if the set-aside is allowed to be applied to the total amount, a factor "number of disadvantaged students/ total enrollment" for each center should be incorporated into the formula;

(ii) if the set-aside can only be used to cover excess costs, a separate formula using these costs as the basis, would be the most appropriate.

II

FRAMEWORK FOR ANALYSIS

Vocational education is an important component of Vermont's overall system of formal schooling; over one-half of all 11th and 12th graders in the State receive some form of vocational training. A succinct statement of the basic aim of the Department of Education's Division of Vocational-Technical Education is found on page 3 of the "Long Range Goals" included as part of its current 5-Year Plan:

> To assist in the development of local programs that will enable each Vermonter to have, at the end of his/her formal education, knowledge of the 'world of work' and acquisition of a salable skill.

This basic aim is expanded upon and supplemented by a number of more specific goals and objectives in the 5-Year Plan. To accomplish these ends, the State has established fifteen area vocational centers (a sixteenth is currently in the planning stages); about 80 percent of all funds spent directly on voca-

tional education in Vermont are expended through these centers. While the operation of the area centers, as well as the operation of other vocational education programs throughout the State, is left to local education agencies, the Department of Education plays a much more active role, both in determining enrollment patterns and in developing specific programs than it does with general education programs. In effect, the need for statewide coordination is deemed to be more important for vocational education. Moreover, in making funds available to the State, the federal government also plays a much more explicit role. As a result, the constraints imposed by the State on local education agencies are to a significant extent the consequence of constraints imposed on the State by the federal government.

The Department of Education's relationship with local agencies is developed principally through two types of mechanisms. The first is its set of procedures for program approval. As a condition to receiving state funds, the local education agency must annually submit a detailed plan to the Department of Education, describing, among other things, the populations to be served, the manpower needs to be met, and the particular occupational programs to be offered. Moreover, for some of its programs, specific proposals must be submitted to the State Department. Approval of these plans and proposals is based upon criteria contained in the State's 5-Year Plan, which, in turn, must be approved by the U. S. Office of Education.

The second basis for the Department's relationship with local agencies is its various methods of providing financial assistance to these agencies. At the present time, monies are allotted to local agencies through four channels: (i) basic support determined through a formula; (ii) direct payments for particular staff; (iii) categorical grants for specific programs; and (iv)

tuition for certain students. Overall, it is the policy of the State Legislature that the non-local share of funds for vocational education should be about 25 percent of the total. Since tuition payments are actually made to sending districts, the actual non-local share is closer to 30 percent. This average, however, is the result of some programs being funded 100 percent with state or federal monies while others receive no non-local funds.

There are, in fact, a number of parameters across which state and federal funds are directly, or in effect, allocated. Basically, monies are allotted to individual institutions; the object of this allocation is generally specific programs that the institution offers--these programs are usually classed either by subject matter (i.e., occupation) or by format (e.g., classroom instruction, work-study, or cooperative education). By design and/or by indirect consequence, these non-local monies are concentrated more heavily on certain subsets of the population and certain areas of the state. Population characteristics which are generally considered relevant include education level (secondary, postsecondary, adult), socioeconomic status, physical and/or mental well-being, and sex. Relevant area characteristics include labor market opportunities, unemployment level, and age and socioeconomic mix of the population.

In considering the distribution of vocational education revenues, the State's 5-Year Plan and the new federal legislation identify "target" groups in terms of each of these parameters. The overall effect of any allocation system will depend upon how the criteria established under each of the parameter types relate to one another. Vermont's concept of regional vocational education establishes geographic boundaries for each of the area centers; that is, each

institution is identified with a particular area of the state and with that portion of the state's population living within that area. While students do cross these boundaries, the analysis in this report assumes that these shifts have only a small effect on overall patterns and that the established areas and populations are those actually served by the respective area centers. (These issues are discussed further in Chapter III, in the section on data measurement, and in Chapter V, in analyzing formula alternatives.)

The allocation of resources for vocational education involves three types of decision: (1) to what extent should the overall distribution of resources be determined by the "plan approval" process rather than directly through the allocation of non-local revenues; (2) what types of distribution mechanism are most appropriate for allocating non-local aid; and (3) what weights should be assigned to the various possible elements of whatever mechanism is adopted.

Clearly, these decisions are interrelated with each other. In addition, answers to them depend in part upon the interrelationships among the four parameters outlined above. In the following chapters, Chapter III focuses principally on the first two of these decisions, Chapter IV is concerned more with the second and third questions.

Moreover, paralleling these decisions must be a concern for efficiency (i.e., controlling program costs). To the extent that expenditures are a part of the aid allocation process, consideration must be given to what cost differentials are valid or allowable. Similarly, the interaction between incentives to encourage operational efficiency and incentives to encourage local effort, particularly as both are embodied in any given allocation mechanism, must be taken into account.

A final word should be presented on the focus of this study. Given the role of P. L. 94-482 in initiating the study and need of the State to incorporate a new aid formula into its 5-Year Plan, primary attention will be given to the formula. Additional finance topics will be considered as they relate to the formula.

III

THE IMPACT OF P. L. 94-482

Title II of the "Education Amendments of 1976" (legally referred to as P. L. 94-482) impacts upon all of various types of decisions involved in the planning and operation of vocational education programs. Moreover, many provisions of this title require changes in current Vermont practices. Some of these provisions are simply a pre-condition to receiving federal monies for vocational education; others may be viewed as constraints on how the State operates its vocational education program, whether or not it receives federal monies. The legislation establishing Vermont's vocational education program (see Appendix B) clearly intends for the State to comply with all federal regulations to the fullest extent possible.

The new federal law clearly recognizes the two distinct processes involved in determining the distribution of non-local funds for vocational education--i.e., developing mechanisms and criteria for program approval and for the actual allocation of monies to those programs which are approved. Several sections of the law are concerned directly with the process of program

approval, primarily through the establishment of requirements for the State 5-Year Plan, the State "Annual Program Plan and Accountability Report," and the annual application for aid to be submitted to the State by those local education agencies seeking a share of the federal dollars. (See Appendix B.)

Of particular importance in terms of their impact on funding decisions are the portions of the law which establish "priorities" for program approval. The primary focus of these priorities is the occupation-mix of a state's program--parts of sections 106, 107 and 108 require the state to justify each occupational program it approves. In so doing, the state must provide evidence of specific manpower needs and the rationale for the type and level of program proposed to meet those needs. Moreover, as required parts of that rationale, two other factors are, in effect, criteria for approval: (1) the likelihood of a program completer funding a job; and (2) the absence of sex bias in a program, or the role of the program in eliminating sex-stereotyping by occupation. Finally, subparagraph 106 (a)(5)(A) requires priority be given to economically depressed areas which propose new programs designed to meet new and emergency job opportunities.

One effect of this explicit approval process is to narrow the range of criteria for actually distributing state and federal monies. In effect the plan-approval process may be seen as acting as a constraint on the distribution mechanism. Alternatively, that process may also be viewed as a mechanism for incorporating into the distribution mechanism priorities or incentives which may be difficult to effectively incorporate into a funding formula. For example, it may be more desirable to give priority to local applications which include a detailed plan for equipment maintenance than to incorporate into the aid formula an incentive for local agencies to perform such maintenance.

The effectiveness of such a provision will depend, in part, on the correspondence between budgeted plans and actual expenditures (see Chapter V for further discussion of how to insure such a correspondence).

The federal law contains two distinct passages that outline criteria which may, or must, be used in allocating available funds. The basic criterion contained in subparagraph 106 (a)(5)(B) requires funds to be distributed on the basis of "economic, social and demographic factors relating to the need for vocational education among the various populations and the various areas of the State . . ." Clause (i) of that subparagraph adds specific details to this criterion with respect to area characteristics: "the State will use as the two most important factors in determining this distribution . . . relative financial ability of [local] agencies . . . and the relative number or concentration of low-income families or individuals within such agencies . . ." (emphasis added; note that "most important" has most recently been interpreted by federal officials to mean "no other factor(s) may have a weight equal to or greater than either of these two factors").

Similarly, section 110 establishes more specific criteria with respect to the populations to be served under subparts 2 and 3: ". . . at least 10 per centum of each State's allotment under section 103 from appropriations made under section 102 (a) shall be used . . . for handicapped persons; . . . at least 20 per centum . . . for disadvantaged persons; . . . at least 15 per centum . . . for [post secondary]." In addition, paragraph 104 (a)(2) requires that "from the funds appropriated to carry out subpart 2, each state shall reserve $50,000" for full-time staff to work towards the elimination of sex stereotyping and sex bias in vocational education programs. To the same

end, clause 107 (b)(4)(A)(iii) calls for "incentives, to be provided to eligible recipients" tc conduct similar efforts at the local level.

Finally, two other provisions of the act establish constraints on the distribution mechanisms. Clause 106 (a)(5)(B)(ii) prohibits funds from being distributed "on the basis of per capita enrollment or through matching of local expenditures on a uniform basis," or from being denied "to any recipient which is making a reasonable tax effort solely because such recipient is unable to pay the non-federal share of the cost of new programs." And clause 107 (b)(3)(A)(ii) requires the State to "continue to use approximately the same amount of its State grant under subpart 2 of this part for programs in secondary schools during fiscal years 1978 and 1979 as it had used during fiscal years 1975 and 1976 unless the State is able to demonstrate in its 5-Year Plan the need to shift funds from such use."

None of those portions of the law dealing specifically with the development of criteria for approving state and/or local plans or for disbursing monies relate such actions directly to concerns about cost. These provisions are written in terms of specific programs or resources, not in terms of providing incentives for efficient operation of a program or whether one program with a slightly lower priority than another might be more cost-effective than that higher priority program. However, the requirements for maintenance of non-federal effort are in terms of expenditures (i.e., compliance could be the result of the same dollars being spent to buy fewer resources). The only direct references to costs are in the provisions for making actual payments to the states. The payments pursuant to section 110 must be matched with at least an equal amount of state and local monies and all other payments from funds appropriated under section 102 must also be matched overall with at least an equal amount of state and local monies. Im-

plicit here, it appears, is a belief that the matching requirement will make it in the state's own best interest to be efficient. And there certainly is no prohibition to states incorporating efficiency incentives into their allocation mechanisms.

At the present time, as noted earlier, Vermont has four basic mechanisms for allocating state and federal monies. Two of these, direct payments for staff and tuitions, are provided uniformly across areas and populations without reference to the criteria discussed above. And with a third, categorical grants, decisions regarding priorities are all made at the plan approval stage. Consequently, only monies dispensed through the formula are done so directly on the basis of criteria related to area and population characteristics. In the past few years, monies allocated through the formula have accounted for about one-fourth of the state and federal monies and one-tenth of all monies expended for vocational education in Vermont. Whether or not this share should be adjusted will be discussed in Chapter VI. For the moment, it is only important to note the overall constraints imposed by the federal law--that is, no matter how monies are dispensed, the priorities identified in the Act must be adhered to and the overall effect of the allocation process must not be contrary to the provisions of subparagraph 106 (a)(5)(B). Moreover, it should also be noted that this constraint applies to all federal funds appropriated under section 103--that is, funds for special programs for the disadvantaged (subpart 4) and for consumer and homemaking (subpart 5) must also be included in determining whether overall distribution and matching requirements have been met.

The current formula contains the following components:

Type	Measure	Weight
1. Manpower needs	share of State's nonprofessional workers in county	5%
2. Vocational education needs	(i) unemployment in local area	10%
	(ii) average income of county	10%
3. Programs	(i) staff (FTE's) of area center	40%
	(ii) expenditures for supplies, equipment maintenance and travel	10%
4. Ability to pay	EGL/pupil of host district	25%

Given the total funds available, the distribution of funds is computed separately for each of these factors; the allocations are then added together to give a total award for each institution (note: the funds available are actually divided into two categories, funds available for the area vocational centers and funds available to all other institutions, based on local budget requests). The overall effect of the formula during the past three years has been about a 2:1 variation across institutions in the share of eligible expenditures reimbursed with state and federal funds; the nonlocal share has ranged from 22% to 45%.

In terms of the various provisions of P. L. 94-482 described above, the following concerns about the present formula need to be addressed:

1) To the extent that vocational education programs train people for local labor markets, the manpower factor is a good indicator of replacement needs. However, if some programs are training people to fill a statewide, or even broader, need, this may not be a useful measure. Looking at the location and employment patterns of program completers would

offer some evidence on this matter. To the extent that many programs serve a broader market, it may be more desirable to include this criteria in the program approval process.

2) Inclusion of factors to serve as indicators of vocational education need is highly consistent with the language of P. L. 94-482. However, the measures currently used have some difficulties. Unemployment is factored in with no reference to the number of people a given unemployment rate represents. For example, while Lamoille County may have twice the unemployment rate of Chittenden County, it still would have only a fraction as many people unemployed since its work force is about one-sixth that of Chittenden County. The income factor has a similar drawback in being calculated on the basis of an unweighted average. A scaling factor (such as pupils or population) would make these measures more effective in reflecting the relative need of the various areas (further discussion of how to define and measure these elements is contained in the next chapter).

3) The two factors related to programs now have a combined weight of 50 percent. This will certainly have to be reduced substantially--such factors are permissible in the formula so long as they do not cause the overall distribution of the formula monies to be out of compliance with the federal law.

4) Ability to pay is certainly an appropriate factor. The use of the equalized grand list is consistent with the general school aid formula and with the manner in which revenues are raised locally. However, using only the host district's per pupil wealth may not be representative of the wealth of the area served by the area center; if not,

this factor would not be consistent with the requirements of the federal law. Moreover, the basis for comparison here is again an unweighted average. Finally, the use of the uniform increment table reduces the monies received by the poorest centers and increases the monies which go to the wealthiest districts. To be consistent with the federal law, it would seem desirable to eliminate the table and to use a weighted average, both of which are easily done.

IV

DATA QUALITY

Dissatisfaction with the allocations resulting from the present formula often get expressed as "concern about the quality of the data." While this concern with data quality is frequently defined rather simplistically as a need for "better counting," a closer examination shows that the data quality problem is really a catch-all for a variety of issues. These issues can be grouped into four categories: clerical accuracy, data definitions, data measurement and data timing. Following a brief discussion of each of these categories, the present data sources and possible alternatives are analyzed in terms of these various "data quality" issues.

The potential for clerical errors arises, in large part, from the fact that much of the data used in the current formula is hand-recorded and frequently never subjected to consistency checks. The actual allocation of formula monies, in fact, is presently done by hand. While there is general

agreement about the need to minimize this type of error (its likely magnitude and possible procedures for minimizing it are discussed below), the choice of a "starting point" is largely a value judgment (e.g., do we assume that taxpayers honestly report their income and begin with the recording of returns by the State Tax Department?).

The second and third categories are very closely related to each other. The former relates to what type of data is most closely related to a particular objective; the latter category relates to the problem of how best to measure the type of data actually selected (note that the availability of better measures for some types of data may be a factor in deciding on the best data definitions). For example, the "need" for vocational education might be defined in terms of unemployment or in terms of job openings. Likewise, "ability to pay" might be defined in terms of the property wealth of the local district or in terms of the income of the district. Some of the definitional choices have been made, or the alternatives severely limited, by the new federal legislation and the related federal regulations--data definition is the only one of four categories on which the federal law impacts significantly.

In most instances, data measurement is a two-fold problem. For items which are ratios, specific measures must be decided for both a numerator and a denominator. Similarly, for measures which are aggregates or averages, what base to use for aggregating or averaging must be decided in addition to the specific numerator. For example, if unemployment is selected as a measure of need, should one include all workers, or just "insured" workers, or just "nonprofessional" workers? And, as a parallel decision, should the unemployment rate be based on the population intended to be served by the area center,

or on the population actually served, or on simply the population of the host district which has administrative and fiscal responsibility for the center. In part, the answer will be based on data availability and/or the cost of acquisition and on whether the different bases yield different aid allocations. If this last criteria is, in fact, a significant factor in the choice made, then it is important to assess the likelihood that present relationships will change and how such changes could be detected.

The choice of a measurement base is an important issue in the funding of vocational education, in part because there are significant differences among the area centers in the number of students enrolled relative to the area's population and in the correspondence between the population intended to be served and the population actually served. The table below shows the extent of these differences for 1975-76.

Enrollment Patterns of 11th and 12th Graders
Area Vocational Centers
1975-76

Area Center	Enrollment in Center as % of Area Total Enrollment	Host District High School	
		% of Area Total Enrollment	% of Area Center Enrollment
Barre	39	39	81
BFA	34	58	83
Brattleboro	44	53	89
Burlington	43	47	76
Essex	31	28	66
Hartford	48	38	80
Lamoille	36	35	80
Middlebury	36	36	58
Mt. Anthony	42	58	90
No. Country	51	57	90
Oxbow	51	51	78
Randolph	43	31	46
Rutland	34	28	47
St. Johnsbury	39	43	80
Springfield	47	68	82
STATE AVERAGE	41	42	74

The final type of concern is with the timing of the data. Clearly the more recent the data, the more nearly it reflects current needs and conditions. However, to the extent that there is a lag between the planning/budgeting process and actual program operation some data may be "too current." A corollary to this principle is that the more stable a particular data item is over time, the more it lends itself to planning. In this regard, measures such as the unemployment rate (with no reference to a base) can fluctuate substantially in a short period of time; grand lists, on the other hand, tend to be fairly stable over a number of years. Use of data items which are collected only once in ten years as part of the decennial census are useful only if they tend not to change much over the ten-year period. In general, it would seem desirable to use more recent information than the 1970 Census. Moreover, for factors which are highly variable, it would seem more appropriate to use a value which represents an average over a longer period of time than to use the most current information available.

The current State aid formula makes use of eight specific data items, identified in Section 3.2.7-2(c) of the State 5-Year Plan as the following: (1) number of "nonprofessional" workers, by county, from the 1970 Census; (2) vocational enrollments, by area and county, from the Department of Education, Fall Data Collection; (3) unemployment rate, by labor-market area, for the month of November, from the Department of Employment Security; (4) average income of families and individuals, by county, from tne 1970 Census; (5) vocational personnel (expressed as full-time equivalents), from the October 1 up-date of Local Plan for Vocational Education; (6) area vocational supplies, equipment maintenance, and travel expenditures, from the Annual Local Financial Report for the previous year; (7) Equalized Grand List for the host district, from

the Department of Education Statistics and Information Section; and (8) Average Daily Membership for the host district, from the same source as number 7.

The first of the current data items has apparently been misrecorded for purposes of computing the formula--some workers were double counted, resulting in a sixty percent over-recording of the number of nonprofessional workers. However, given that the same type of error was made for each county, and that this factor had only a five percent weight in the formula, the overall effect on the allocation of formula aid was insignificant--for no area center did the error exceed 0.2% of their total formula aid. Of much greater consequence is the fact that this data item reflects conditions in 1970 and that since that time there have been significant changes in employment patterns. Overall the labor force has grown nearly ten percent. Within that figure, agriculture's share has declined substantially; the share employed in construction and manufacturing has also declined somewhat, while the relative number of workers in trade and service has increased. The only up-to-date figure available is total number of workers in each area. However, as noted in the first report, it would seem most appropriate to omit this factor from the formula and, instead, let its impact be felt in the program approval process.

The "need" for vocational education is reflected both in current manpower requirements and in the current supply of unemployed (or underemployed) workers. Over time the manpower requirements are much more likely to remain stable than is the supply of unemployed persons--statewide economic development is occurring very slowly. Moreover, accurate data on unemployment is much more readily available than data on specific manpower requirements.

ternatives, there are two potential issues. The first is whether "enrollments" or "full-time-equivalent enrollments" should be used. While the latter number is perhaps a more accurate reflection of a center's work load, it is more difficult to collect. Given that there is only minimal variation across centers, using enrollment data is completely adequate for purposes of the formula. The second issue is whether program inputs should be measured in terms of dollars or actual resources. At the present time, teachers are counted rather than salaries, but dollars expended are used for other eligible inputs. Given that there is significant variation in average teacher salaries, use of FTE's may be the best alternative; however, it would be simpler to use a single figure, and to the extent that differences in other expenditures offset salary differences, use of the single measure may yield the same distribution.

The final factor in the present formula is based upon both the equalized grand list of the host district and the district's average daily membership. The latter figure is well recorded and the most appropriate denominator if one wants to focus on funding requirements. If it is desired to focus more on the supply of funds available, then population may be a more desirable denominator. One difficulty with this latter alternative is that it is not routinely collected on an annual basis, so that some estimating would likely be involved. With regard to the Equalized Grand List, there are two issues. The first issue concerns whether more than simply the host district's grand list should be used to measure ability-to-pay. To the extent that the center is intended to serve a number of school districts, it would seem desirable to include them all in such a measure. In fact, the federal law seems to suggest a broader approach: ability-to-pay should be measured on the basis of the area served. However, determining how to combine the

grand lists of various towns might be difficult to do, especially where districts send students to more than one area center. Moreover, the host districts account for over seventy percent of vocational enrollments, so that some sort of weighty scheme would have to be employed, one which would change every year. And, finally, under present arrangements, sending districts share in the local costs of vocational education only through tuition payments for students who actually attend; that is, the risk of underenrollment is borne by the host district. The actual consequences of using alternative bases for measuring ability-to-pay will be tested as part of the empirical analysis.

In addition to the factors currently in the formula, the new federal legislation mandates an additional factor: "the relative number or concentration of low-income families or individuals." Two sources of data on low-income households are readily available. The first is the Vermont State Income Tax Returns, which indicate the number of low-income people who are working. One problem with this data is that it does not distinguish among full- and part-time employment; the fact that a majority of the lowest returns are from single individuals may indicate that these are secondary wage earners (i.e., students, youths living at home, etc.) who are deliberately working part-time. Returns are classified by filing status, however, so that looking at joint returns (i.e., married couples) should provide a good estimate of low-income working families. Similarly, the number of exemptions claimed on these returns will be an indicator of the number of persons accounted for by these tax returns. The second source of data is the case load of the Aid-to-Families-with-Dependent-Children program. This information, including number of families, number of adults, number of children and dollars of benefits are

tabulated each year for the month of February--the Department of Social Welfare believes that this is a representative month. While there is likely some overlap between these two sources of data, there usually is only one parent present in an AFDC family while a joint return requires both parents be living together. Hence, at least initially it would seem desirable to test the combination of these two measures. Finally, it should be noted that, at present, both are tabulated by county. Given the distribution of the area centers, this base should create little, if any, inequity in aid distribution.

Finally, the new federal legislation also requires that funds be set aside for three specific populations: postsecondary, the handicapped and the disadvantaged. These first two groups are dealt with separately in the State of Vermont; consequently, it is likely not appropriate that they be accounted for in a general vocational aid formula. With regard to the disadvantaged, however, it would seem to be desirable to incorporate the aid set aside for them into the formula. The State 5-Year Plan allows for a number of definitions of disadvantaged. At the present time, such students must be identified and counted by the local authorities. It seems desirable to continue this practice, particularly given the incentive of state aid to identify such students. As for incorporating these numbers into an aid formula, it should be recognized that the additional resources required to teach such students are dependent upon both the absolute number of such students and the share they represent of a given area center's enrollments. Both of these measures will be included in the empirical analysis.

The State 5-Year Plan asserts that "Data used will be based, as nearly as possible, on the service area of the respective schools." Basically,

these "areas" are a collection of local school districts for which the respective area centers are the most accessible (i.e., in most cases, non-host districts send their students to only one area center). As a rough geographical approximation of these various areas, the State Plan, on page 131, presents a map with each center encompassed by a circle with a 15 mile radius. Looking both at the map and at the list of where respective districts send their students, there appears to be a reasonable correspondence between service areas and county boundaries. Similarly, there is a reasonably good correspondence between these areas and the "local labor markets" as these markets are defined by the Department of Employment Security.

Much information, particularly about the general population, is not available by "area center service area." Hence, the relationships identified above are important because they permit data related to these alternative bases to serve as useful and valid surrogates for "service area" data. As part of considering formula alternatives, the impact of using different bases will be examined more closely.

With respect to what base is actually used for a given data item, three points seem important. The first is that all of the factors in the formula need a denominator of some type to serve as a scaling factor. While the relative concentration of some factors is important, both comparability among various elements of the formula and overall equity to the population being served require that aid based on the formula be related to the magnitude of the condition served. Under the present formula, for example, Hyde Park may get as much as one and one-half times the total aid Burlington receives based on unemployment, even though Burlington has five times as many unemployed persons as the Hyde Park area and Burlington's program serves nearly three

times as many students. Part of this inconsistency may be the result of the current formula's algebraic form (this issue is discussed in section II).

The second point regarding what base to use is that for some factors, the general population of the area may be the more appropriate base, while for others the number of pupils may be more appropriate. This situation is also reflected in P. L. 94-482 where some parts of the act refer to the pupils being served and others to the population being served. This dichotomy is a potential problem, in terms of comparability across elements of the formula, in situations where the relative size of the area vocational center does not reflect the size of the area population relative to the State total. In the alternative formula mechanisms discussed in part II, an effort is made to account for these differences.

The third point is that cost, availability and accuracy are valid concerns in selecting a particular item for inclusion in the formula. If data, for example, is available by county, it may be more desirable to use such numbers rather than undertake the cost (and initial accuracy problems) of developing a new data set. Such considerations are even more important when the need for comparable data from previous years is necessary. The data quality section of the final report will detail some of the tradeoffs involved for the recommended formulas.

V

FORMULA ALTERNATIVES

The current formula for allocating federal and state aid for vocational education is difficult to characterize. Indeed, it is effectively six independent calculations linked together only by the fact that the total dollars allotted under each calculation are a given fraction of the total general aid funds available--i.e., the funds available are apportioned to each of the formula elements, and then separate calculations are made to allot the monies available under each element. Implicit in such a formula is the assumption that interactions among any of the various criteria under which aid allocated is small or not important; the effect of this assumption is that districts with relatively average values under all criteria will not do as well as they would under a formula which explicitly took account of interactions between the various formula elements.

Modifications to a formula such as the present one may be of three types: (i) change weights; (ii) change way elements are calculated; and/or (iii) actually change elements. The first of these refers to maintaining the same basic formula, but assigning different relative weights to the various components. P. L. 94-482 requires at least some of the present weights be changed, in order that ability-to-pay and the relative concentration of low income families be given their proper weight--as noted in the first report, it is understood that the two together must total at least 50 percent. In addition, the new law requires that unless monies are set aside and dispensed

separately, the effect of the formula must be that 20 percent of federal funds appropriated under section 102(a) of P. L. 94-482 must be expended on disadvantaged students, 15 percent on postsecondary students and 10 percent on handicapped students. In Vermont, programs for all three of these groups have been administered separately in the past. Given current program structures, it seems desirable to continue this approach for postsecondary and handicapped students. However, given that disadvantaged students are incorporated into regular secondary programs, the basic formula would seem the preferable mechanism for dispensing these funds. Including in the formula a factor related to the numbers of disadvantaged students at the various centers would require further alteration of existing weights.

Several possibilities for change in the way various elements are calculated were noted earlier in the section on data alternatives. It was suggested that the current methods for calculating the unemployment factor and the average income factor were particularly likely candidates for revision. Moreover, in general there appeared to be a need to make all of the elements more comparable to one another, such as through using a common base (or denominator) in each factor. Similarly, possibilities for deleting some of the current factors and/or adding new ones have also been observed. Given the language of the new federal law, it would seem appropriate to delete the manpower factor (with the understanding that such concerns become part of the program-approval process) and to add a "disadvantaged student" factor. The exact form of this latter factor would depend upon the type of formula chosen (see below).

Finally, as noted in chapter IV, the choice of the data base to use for any given factor involves the interaction between the quality of the re-

cording of the data and how well a given base reflects the population served by the respective area centers. In this regard, extensive statistical analysis was done on the impact of choosing a particular base for each of the three types of population-based factors in the formula. In general, the following comments could be made:

1) Unemployment statistics are currently collected on a "local labor market area" basis. Given the size and economic structure of Vermont, to try to collect these statistics on some other basis would not be particularly meaningful. The alternatives, then, for purposes of a formula, are to identify each area center with one local labor market area, or to identify them with as many as overlap their particular service area and to develop a weighted average of relevant unemployment rates. Largely because thirteen of the fifteen centers are located at the center of one of the local labor market areas and because in areas where geography permits overlap, unemployment rates do not differ significantly, differences between using one labor market area for a center versus using a weighted average were negligible for all the centers.

2) Property statistics are collected on a town-by-town basis; in fact, as part of the general state education aid formula, the particular statistic "Equalized Grand List/Average Daily Membership" is calculated annually for each school district. The choice, then, is to use a weighted average of the districts served (with a few exceptions, sending districts generally tuition their students to a single area center), a county statistic, or to simply use the host district as the base.

Analyzing the differing effects of these alternatives on the various centers aid, one finds little significant change; in fact, no district's allocation changes by more than 1.6 percent. This result holds for the most part because area centers tend to be located in districts of roughly average property wealth, and because the host district's weight usually causes it to dominate any weighted average. Given the theoretical merits as well for using only the host district's property wealth, there is little reason for going to the trouble of computing a weighted average.

3) Income statistics are also gathered on a town-by-town basis. In general, income is subject to greater fluctuations than property values. Moreover, there are some difficulties in assigning incomes to specific towns. In addition, there tends to be greater variation in income across towns, so that a single town may not be representative. The alternatives, then, are to use a county base or a weighted average of the districts served. The advantage of the former is that it is more stable (the weights in the average would have to be altered each year), it is simpler to calculate, and values may be checked by data from other sources (particularly the federal government) which are also collected on a county basis. In fact, the differences between the effects of a weighted average and a county-based statistic result in no more than a 3 percent variation in aid for any district. Given the general concern for accurate data, using the county measure would seem preferable.

Overall the current formula is best characterized as a "flat grant" type formula. Fixed dollar amounts are awarded to the local agencies on the basis of several criteria, but the overall amount is not tied to single factor (such as number of students or amount of expenditures) which serves as a measure

of local effort. The particular formula used has worked well largely because 50 percent of the total funds awarded are allotted on the basis of program resources and another 25 percent are tied to the number of pupils served. Given the modifications required by P. L. 94-482, such a formula would continue to work well only if the various elements were each related to some common denominator.

An alternative would be to use a formula with a different algebraic form. Considering the constraints of the federal legislation, the most viable candidates would be any of the class of formulas which can be characterized as "variable matching grant" formulas. Basically, such formulas relate the combined effect of the various allocation criteria to some measure of local effort. They may in fact take a number of specific forms, depending upon what aspect of the school finance process local authorities wish to emphasize. Given the State's basic objective of an overall nonlocal share of 25 percent, the so-called "percentage equalizing" formula would seem most appropriate--the present so-called "Miller" formula for aiding general elementary and secondary education is, in fact, this type of formula.

Development of such a formula would involve three steps: (1) choosing the specific factors and their relative weights for being combined into a "matching index"; (2) choosing a "base" to be matched; and (3) choosing the specific methods for determining the values to be inserted into the various parts of the formula--this last step is essentially the same task described above in connection with flat grant formulas. Generally, formula quantities are converted to index values--that is, for any local agency, the value of a given factor is divided by the State mean value for that factor. The principle value to this approach is that it emphasizes the relative position of each local agency. By putting all factors on a common scale, it also makes it much simpler to combine them.

It should be clear from the discussion up to this point that the State does in fact have a large number of choices open to it, and that, in most cases the choices are as much a matter of value judgment as they are of empirical fact. In the development of specific recommendations for a new formula as part of this report, three principles were followed:

1) The formula should be consistent with, and to the fullest extent possible it should foster, the objectives of the State's 5-Year Plan. In this context it is understood that any new formula must be fully compliant with the requirements of P. L. 94-482.
2) The formula should be of such a nature that local agencies can relate it to their planning and budgeting processes. In this regard, the formula should (i) be simple--i.e., have the fewest possible factors consistent with achieving the objectives of the State 5-Year Plan; (ii) be consistent--i.e., be based on factors related to one another and to the population served by the respective centers.
3) The formula should require data which is reasonably current and reliably recorded (note that "current" is understood in the context of the program budgeting process and the timing of actual allocation decisions.

The issue of what factors should be included in a new formula and the issue of what algebraic form the formula should take were, in general, treated separately (a third issue of what part of total nonlocal revenues should be administered through the formula was also dealt with by itself--and in fact, discussion of this issue is left to the following chapter).

With respect to formula elements, it is recommended that five factors be considered in allocating funds through the formula:

1) relative concentration of low income families in the area served by each center;
2) relative unemployment rate in the local labor market area;
3) property wealth of the host district (as measure of ability to pay);
4) relative concentration of "disadvantaged" students at each institution; and
5) the relative size of the program at each institution.

The specific data recommended to be used to measure these factors are described below in connection with specific formula alternatives. The relative weight to be assigned to each factor is dependent on the type of formula selected (see below).

With respect to formula types, both a flat grant type and a variable matching grant type would be acceptable. However, the latter type seems more consistent with the principles listed above and, therefore, it is listed as the primary recommendation. A separate issue is the treatment of the disadvantaged set-aside (actually this is an issue only if a variable matching grant is used). In terms of the above principles, it would be preferable to incorporate these monies (and this factor) directly into the formula if federal authorities deem that permissible. The formula would comply with the federal law, so long as (1) the federal set-aside divided by the total number of disadvantaged students is less than one-half average per pupil cost for the centers combined (at present it equals 0.19); (2) monies may be applied to the total cost of educating the disadvantaged; and (3) maintenance of effort applies to state and local funds only. If any of these three conditions are not met, then the disadvantaged monies must be treated separately, and should

be done so on a "weighted per pupil" basis (see below). For each of these three alternatives, it is recommended that the following weights be assigned to the various factors (weights in the present formula are included for comparison):

Factor	Current Formula	Var. Match Grant w/Disadvantage	Var. Match Grant w/o Disadvantage	Flat Grant
Income	.10	.30	.35	.25
Unemployment	.10	.20	.30	.20
Property Wealth	.25	.30	.35	.25
Disadvantaged	-0-	.20	-0-	.20
Expenditures	.10	*	*	.10
Staff	.40	-0-	-0-	-0-
Labor Force	.05	-0-	-0-	-0-

*included as the "base" for matching

The specific recommendations, then, are as follows:

1) Variable Matching Grant--disadvantaged included:

It is recommended that Section 3.2.7-2 of the State Plan be amended, beginning with the line, "Five percent of the funds available . . ." on page 38 of the Plan, to read as follows:

> Five percent of the funds available will be set aside to be granted to schools for Excess Costs based on Information supplied by the Area. Excess Costs are here defined to include any of the following: (1) new programs designed to meet new and emerging manpower needs in areas of high unemployment; (2) special costs associated with the education of persons with limited English speaking ability; and (3) unanticipated cost increases since the October update--items which may be given consideration included such things as teachers' newly negotiated contracts and fringe benefits, teacher replacement at a different salary, hiring of additional teachers and

purchase of additional supplies because of unexpected program expansion, unusual transportation and maintenance costs. In the event that funds available are insufficient to cover such costs, requests will be prorated using the "Need Index" described below. Any unexpended funds in Excess Costs not used in this manner by April 1 will be put back into the formula.

From the remaining monies, the State will pay to the appropriate local education agencies a share of those agencies' eligible expenditures; the State's share for each agency shall be equal to

$$P \times \text{Local Need Index}$$

where "P" equals the State's share for a local agency with average need (LNI = 1.0), to be determined by the funds available; and the "Local Need Index" is determined as follows:

$$LNI = 0.2(DP) + 0.3(LI) + 0.3(EGL) + 0.2(UN)$$

where,

$$DP = \frac{\text{number of disadvantaged students at school}}{\text{total enrollment of school}} \div \frac{\text{total disadvantaged pupils in State}}{\text{total enrollment in State}}$$

$$LI = \frac{\text{AFDC recipients + low income families in county}}{\text{total population of county}} \div \frac{\text{AFDC recipients + low income families in State}}{\text{total population of State}}$$

$$EGL = \frac{\text{Equalized Grand List of host district}}{\text{ADM of host district}} \div \frac{\text{Equalized Grand List of State}}{\text{ADM of State}}$$

$$UN = \text{unemployment rate of local area} \div \text{unemployment rate of State}$$

"eligible expenditures" are defined to include all direct expenditures on approved Section 120 (b)(1)(A) programs during the year immediately preceding the year in which aid is awarded.

1-A) Variable Matching Grant--disadvantaged excluded

The formula would be the same as above, except that

a) LNI = 0.35 (LI) + 0.35 (EGL) + 0.30 (UN),

b) the following section would be added to the State Plan--

monies set aside for disadvantaged students shall be allotted to the appropriate local education agencies according to the following formula:

$$\text{Allotment} = \frac{(DP) \times (\text{number of disadvantaged pupils})}{\text{sum of } (DP) \times (\text{disadvantaged enrollment})} \times \text{funds available for all eligible institutions}$$

Any monies not expended from these allotments will be made available to the remaining eligible institutions on a pro rata basis.

2) Flat Grant:

The same change in the definition of "Excess Costs" as above would be made. In addition, the following changes in the calculation of formula elements would be made:

a) Part I relabeled "Disadvantaged Students":

$$\frac{\text{disadvantaged pupils}}{\text{total enrollment}} \div \frac{\text{total of areas disadvantaged pupils}}{\text{total of areas enrollment}} = DP$$

$$\frac{(DP) \times \text{disadvantaged pupils}}{\text{total of areas } (DP) \times \text{disadvantaged pupils}} \times .20 \text{ of funds available} = A$$

b) Part II:

A: change to ".80 of funds available"

B: calculate (LI) as in 1 above

$$\frac{(LI) \times \text{enrollment}}{\text{total of areas } (LI) \times \text{enrollment}} \times 0.20 \text{ of funds available} = B$$

c) in Part III, delete A; change B to read as follows:

$$\text{A. } \frac{\text{eligible expenditures}}{\text{enrollment}} \div \frac{\text{total of areas eligible expenditures}}{\text{total areas enrollment}} = \text{EX}$$

$$\frac{\text{(EX) x enrollment}}{\text{total of areas (EX) x enrollment}} \times 0.10 \text{ of funds available} = \underline{C}$$

d) in Part IV, eliminate steps D through H and insert:

$$\text{D. } \frac{\text{(AM) x enrollment}}{\text{total of areas (AM) x enrollment}} \times 0.25 \text{ of funds available} = \underline{D}$$

The specific data recommended to be used in these formulas is as follows:

1) number of disadvantaged pupils as reported by the area centers as part of Fall Data Collection;

2) total enrollment from Department of Education--Fall Data Collection;

3) number of AFDC families from Department of Social Welfare (report for February immediately preceding current school year);

4) number of low income families from Department of Taxes (number of returns filed as joint returns, with adjusted gross income less than $5,000, for year preceding current school year;

5) equalized grand list and A. D. M. data from Department of Education Statistics and Information Section;

6) unemployment is average total unemployment for local labor market area for the 18-month period ending June 30th immediately prior to the current school year--from the Department of Employment Security;

7) population data is from Department of Health, Vital Statistics Section --data are most recent year available (currently 1975).

One final note should be made regarding the contingency fund and the set-aside for excess costs. The requirements of P. L. 94-482 do not appear to prohibit such provisions (so long as the overall matching requirements are met, a condition which should have little effect on these provisions). Moreover, the recommended modifications of the present formula do not alter the need for these provisions. It is recommended, however, that the definition of excess cost be modified to insure that the State is in compliance with federal regulations. In particular, the federal law requires states to address the problems of persons with "limited English speaking ability," and to give priority to "new programs designed to meet new and emerging manpower needs." Given the very small foreign born population in Vermont (considerably less than 1 percent of the population) it is estimated that there are no more than 150-200 students in Vermont schools with limited English speaking ability--this assumes all foreign born students or children of foreign born parents have difficulty. Similarly, the limited economic development in Vermont makes programs which fit into the above priority category unlikely. As a result, it would seem better to treat both of these situations as unusual events and, hence, more appropriately classified as "excess costs."

The actual impact of the proposed changes in the formula on each of the area centers for fiscal years 1976 and 1977 is shown in the table below. In general, the recommended formula tends to distribute aid in a more uniform manner, principally as a consequence of establishing consistency across the various factors used in the formula. However, the new flat grant formula shows a more uneven distribution, underscoring the role that the high weights assigned to program factors play in the present formula. To the extent that

VOCATIONAL EDUCATION
FORMULA AID
UNDER ALTERNATIVE PLANS
1976-1977

AREA CENTER	FY1976								FY1977							
	CURRENT		VGM-INCL		VGM-EXCL		FLAT GR.		CURRENT		VGM-INCL		VGM-EXCL		FLAT GR.	
	$/PUP	%	$/PUP	%	$/PUP	%	$/PUP	%	$/PUP	%	$/PUP	%	$/PUP	%	$/PUP	%
BARRE	120	33	95	26	92	25	97	26	107	29	103	28	106	29	119	32
BFA	125	39	103	32	136	42	150	47	142	44	113	35	152	47	162	50
BRATTLEBORO	98	25	130	32	123	31	121	30	100	25	140	35	144	36	152	38
BURLINGTON	131	23	187	33	224	39	193	34	148	26	188	33	245	43	258	45
ESSEX JCT.	122	25	98	20	94	19	80	16	124	26	115	24	125	22	101	21
HARTFORD	111	26	109	26	104	24	96	22	131	30	118	27	118	27	121	28
LAMOILLE	165	45	95	26	90	25	96	26	135	37	95	26	99	27	117	32
MIDDLEBURY	126	29	100	23	94	22	88	20	138	31	116	26	115	26	113	26
MT. ANTHONY	124	28	117	27	107	25	98	22	199	32	193	31	179	27	125	20
NO. COUNTRY	98	28	129	37	175	50	175	50	123	35	126	36	174	50	174	50
OXBOW	128	37	97	28	103	30	113	32	126	35	109	32	119	35	140	41
RANDOLPH	168	33	135	27	130	25	111	22	172	33	156	30	146	28	134	26
RUTLAND	145	23	175	27	156	24	111	17	173	28	198	32	179	29	140	22
ST. JOHNSBURY	142	29	144	29	129	27	110	22	139	26	182	34	171	32	141	29
SPRINGFIELD	181	29	189	30	163	26	112	18	280	44	210	33	185	29	133	21

there are systematic shifts in funds, they are the result of variation in the factors mandated by the new federal law. Of particular importance is the variation in the concentration of "disadvantaged students" reported by the respective centers. This variation is not strongly correlated with the economic status indicators (unemployment and concentration of low income families), suggesting that either the definition of disadvantaged may need to be tightened, or some auditing of local reporting may be necessary.

VI

ADDITIONAL REVENUE AND EXPENDITURE ISSUES

The primary focus of this study has been the development of a new formula for allocating vocational education monies. In the context of considering the impact of a new formula, it would seem useful to analyze two related issues: (1) incorporating into the formula those state monies now dispensed as tuition and/or as direct payments for staff salaries (the other type of state aid used presently, categorical grants for specific programs, is more directly related to the State's objectives and should be left as is); and (2) requiring area centers to report a total budget (i.e., one that includes expenditures for plant operation and maintenance).

The desirability of making these changes is, to a significant degree, dependent on the empirical consequences. The tables below show some of the effects. First, however, the rationale for (and objections to) making such changes are briefly outlined.

1) Dispensing tuition payments through the formula: such a change would simplify the aid process and would further concentrate funds on those area centers judged by formula criteria to be in need. Its primary redistributive effect, however, would be to shift the benefits of state aid from the sending districts to host districts. Given that host districts already enroll a disproportionate share of students, such a move would likely aggravate the problem. Also, to the extent that shifting funds to the formula would have an effect on the overall state appropriation for vocational education, it would likely decrease it. Some of the problems with the present tuition system may be related to the seeming lack of correspondence between average costs and established tuition rates, this despite a state law requiring such correspondence. Finally, the logic of excluding sending districts without high schools is not clear, given that the actual tuition is about 25 percent of full cost, roughly the excess presumed to be associated with vocational education.

2) Dispensing the current payments for staff salaries through the formula would seem to simplify the aid process and would apparently have little effect on the distribution of aid. Again, a possible reservation is the impact on the overall appropriation, given that these items are supported at 75 percent.

3) Data on total budgets is only available for FY 1975. Analysis of this

data suggests that while the expenditures for plant operation and maintenance are a substantial part of total costs (overall, about one-third), including them in the allocation base would not cause any significant shifts in the distribution. The primary benefit might be to help better identify who really bears the costs of the area centers, as between the host districts and sending districts; in doing so, some of the variation between tuitions and average costs within districts might be eliminated. Including these expenditures might also act as a catalyst for increasing the total state appropriation for vocational education (to the extent that that appropriation is tied to total expenditures.) The principle drawback is that inclusion might weaken efforts to encourage expenditures on the particular items now covered.

COMPARISON OF TUITION AID AND FORMULA AID
FY1976

AREA CENTER	TUITION /STUDENT	COST/ PUPIL	RATIO	%AIDED IF TUITION	%AIDED IF FORMULA	TUITION STUDENTS AS % OF ENROLL.
BARRE	435					19
BFA	131					14
BRATTLEBORO	183					10
BURLINGTON	327					
ESSEX JCT.	425					
HARTFORD	338					12
LAMOILLE	327					16
MIDDLEBURY	237					38
MT. ANTHONY	434					
NO. COUNTRY	330					1
OXBOW	344					
RANDOLPH	314					42
RUTLAND	420					41
ST. JOHNSBURY	502					
SPRINGFIELD	346					18

INCLUDING ANCILLARY COSTS IN FORMULA AID
FY1976

AREA CENTER	ANCILLARY AS % OF TOTAL	CURRENT ANCILLARY AID	RELATIVE COST PER PUPIL	AID IF ALL FORMULA (AS % OF CURRENT)
BARRE				
BFA				
BRATTLEBORO	13			
BURLINGTON				
ESSEX JCT.				
HARTFORD				
LAMOILLE				
MIDDLEBURY				
MT. ANTHONY				
NO. COUNTRY				
OXBOW				
RANDOLPH				
RUTLAND				
ST. JOHNSBURY				
SPRINGFIELD				